Prepic32 - Prerecognition of pictures (experimental application)

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This software has been elaborated in the framework of the IT4Innovations Centre of Excellence project, reg. no. CZ.1.05/1.1.00/02.0070 supported by Operational Programme 'Research and Development for Innovations' funded by Structural Funds of the European Union and state budget of the Czech Republic.

The application is intended for pattern recognition in images. It is developed under Borland Delphi and its Visual Component Library written in Object Pascal. Target platform includes Windows 32 OS (e.g. Windows XP, Vista, 7 etc.). It works in two modes - like experimental application with GUI to tune up patterns and other properties and also like console application to batch process images for recognition.

Instalation and execution

The application can be executed both with GUI and like console app. There is no need to install it, just extract the zip compressed file into desired directory and then you can run it by **executing prepic32.exe** file. It will invoke GUI version. The **console version** could be invoked by starting the same executable with **several parameters**. First parameter specifies directory to be batch processed and second one could optionally specify pattern file (*.pcp) to recognize with. If no pattern file specified default or ini file specified pattern file is loaded. Examples of running:
Prepic32.exe - with no parameter specified it will open GUI version.
Prepic32.exe patterns – it will run console mode application with batch recognize of images (0_0.bmp, …); patterns are compared over either default.pcp file or last opened one specified in prepic.ini file (text readable structure).
Prepic32.exe patterns numbers – it will run console mode application with batch recognize of images (0_0.bmp, …); patterns are compared over specified numbers.pcp file (if it exists).

Main Pane

The main pane splits into several areas:

Area 1. Active patterns and recognized image - Shows loaded or created patterns to recognize and the last image, where the possible pattern should be found.
Area 2. Batch recognition of prepared images - Show results of recognition in selected directory (images are named like X_Y.bmp, where X is number of row starting 1 and Y is number of column starting 0, e.g. 1_0.bmp). It shows 3 best matching patterns index and below the image the tally level (similarity with pattern) - red is best)
Area 3. Pattern editor - Allows to edit patterns and tested (recognized) picture. It enables to load and to store patterns and tested pictures. Below there is possibility to load pattern automatically from image (threshold defines minimal intensity of pixel to be treated as non-zero point in pattern and increment adds intensity to them; it can be also computed automatically and it can be chosen black or white pattern in image - caution with black patterns, it doesn't work as well as for white ones).
Area 4. Loading of pattern files, computation trigger and batch process trigger.

Prepic Win32 version 3.0
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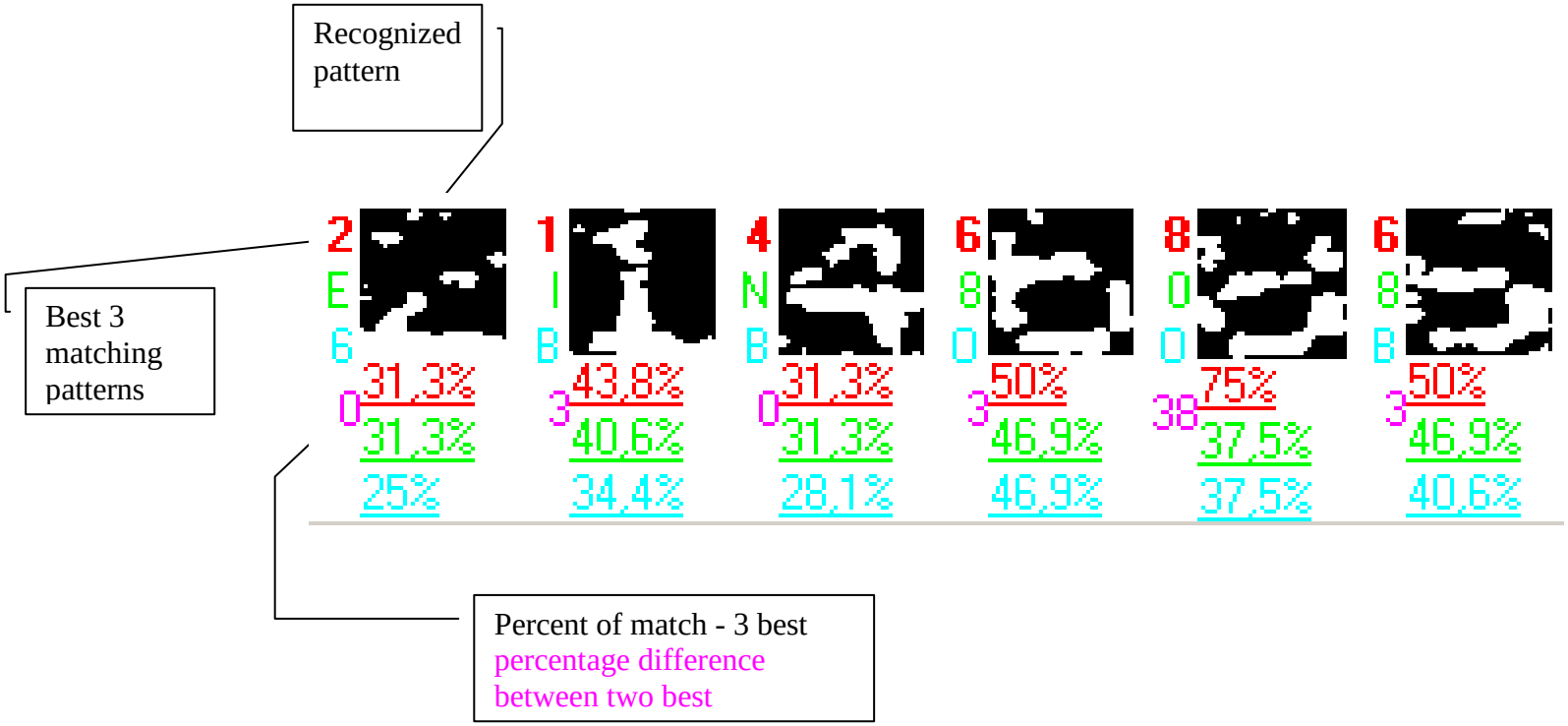
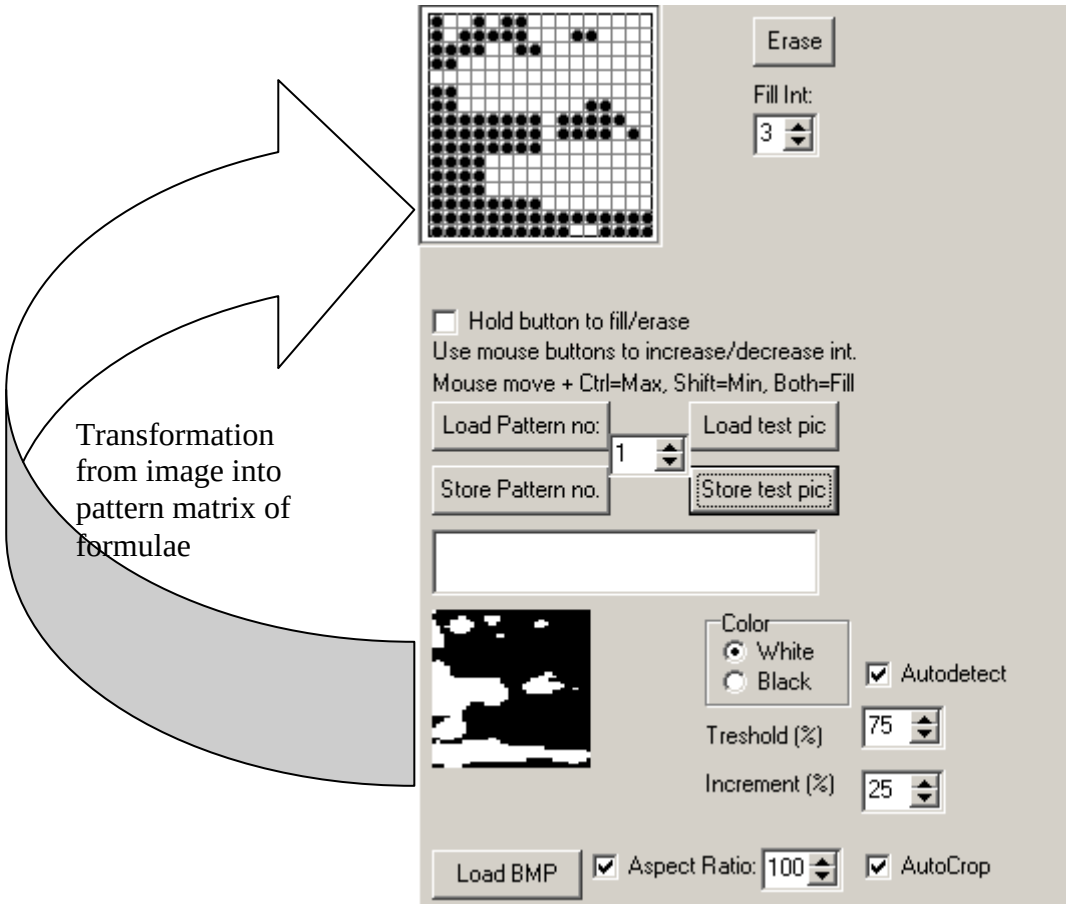
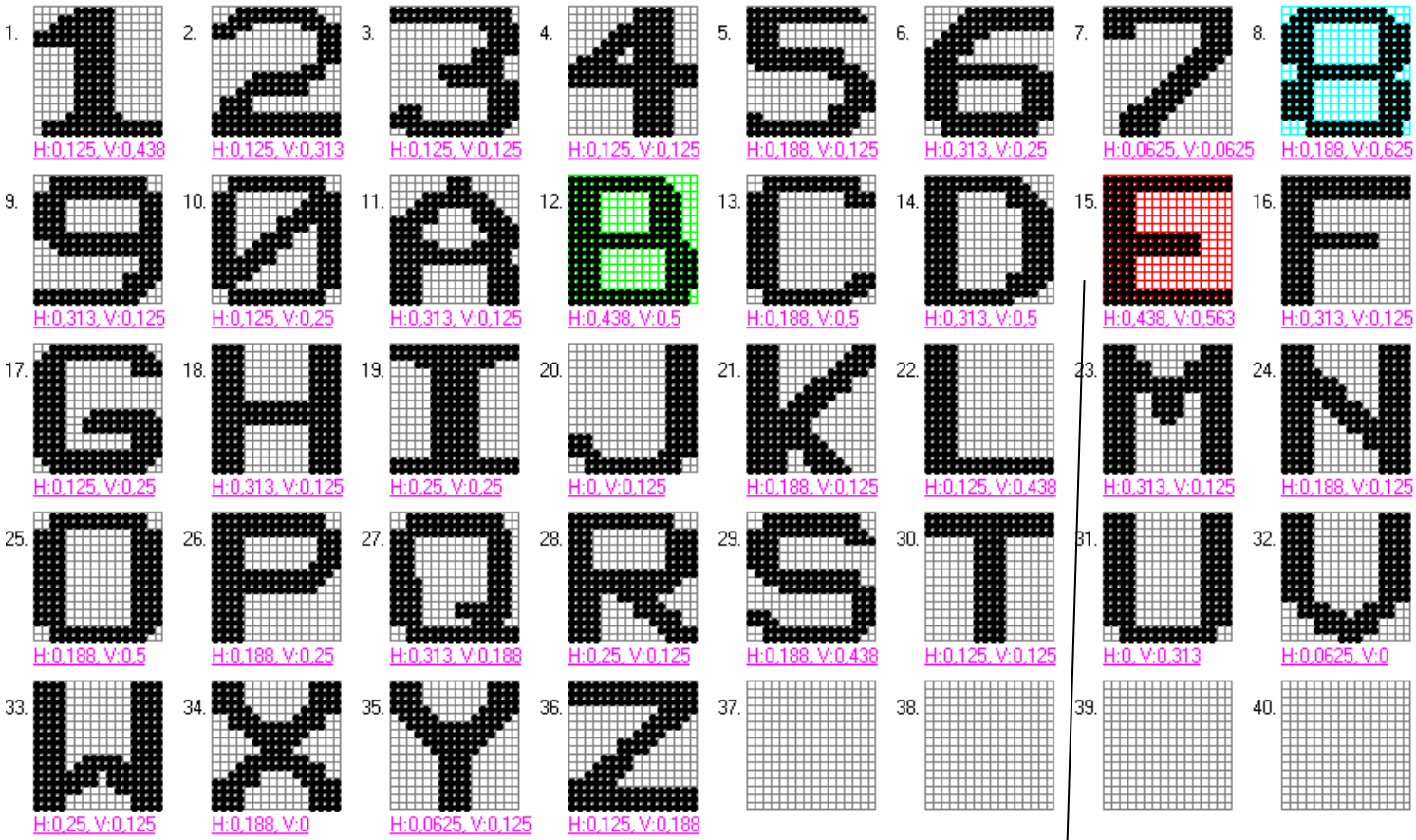
40.
Area 1
Erase
Fill Int:
3
Area 3
Hold button to fill/erase
Use mouse buttons to increase/decrease int.
Mouse move + Ctrl=Max, Shift=Min, Both=Fill
Load Pattern no:
1
Load test pic
Store Pattern no.
Store test pic
Color
White
Black
Treshold (%)
92
Increment (%)
8
Autodetect
Load BMP
Area 2
Best Results:
Filename:
patterns\vzory120224al2
Compute+Normalize
Compute
Open DOS file
Save DOS file
New/Empty
Tally:
75
%
Area 4
Recognized patterns directory:
patterns
Recognize
autopat
AutoPat

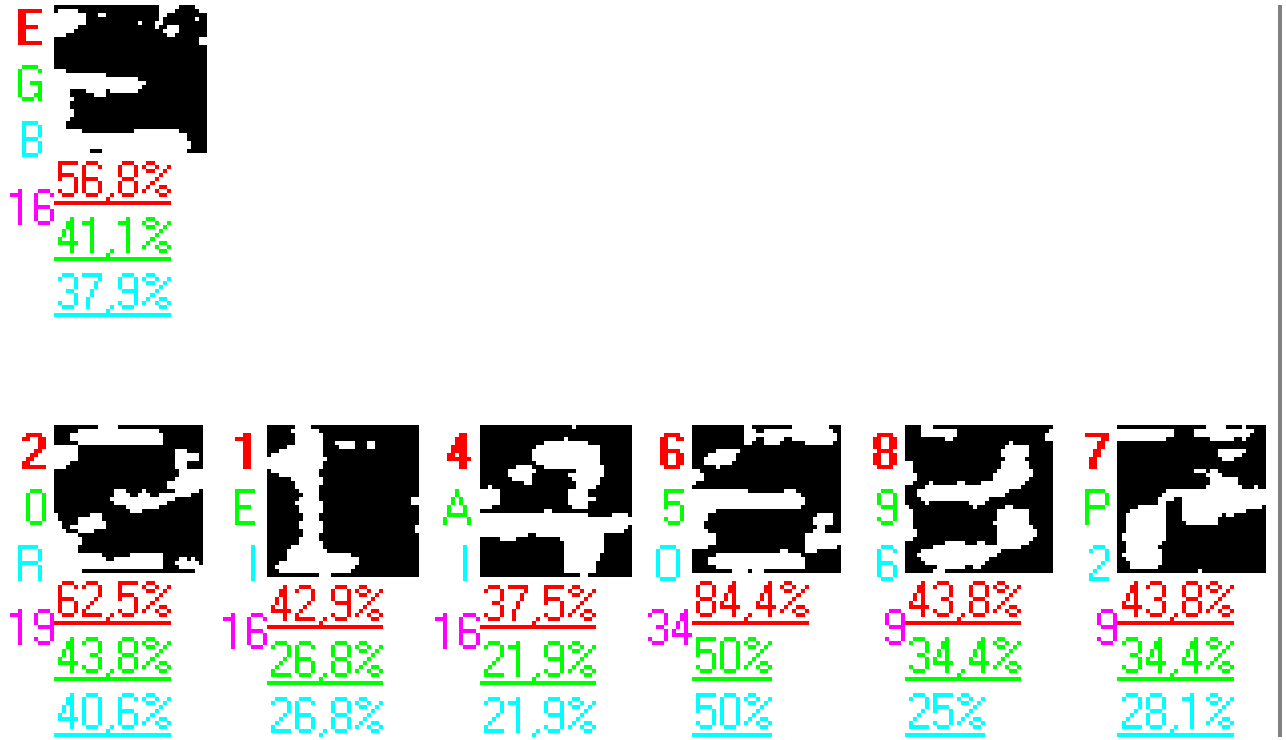


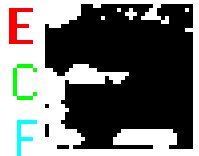
Batch recognition


Erase
Fill Int:
3
Hold button to fill/erase
Use mouse buttons to increase/decrease int.
Mouse move + Ctrl=Max, Shift=Min, Both=Fill
Load Pattern no:
1
Load test pic
Store Pattern no.
Store test pic
Color
White
Black
Autodetect
Treshold (%)
75
Increment (%)
25
Load BMP
Aspect Ratio:
100
AutoCrop
Transformation from image into pattern matrix of formulae

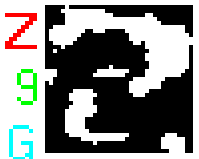

1.
H:0,125, V:0,438
2.
H:0,125, V:0,313
3.
H:0,125, V:0,125
4.
H:0,125, V:0,125
5.
H:0,188, V:0,125
6.
H:0,313, V:0,25
7.
H:0,0625, V:0,0625
8.
H:0,188, V:0,625
9.
H:0,313, V:0,125
10.
H:0,125, V:0,25
11.
H:0,313, V:0,125
12.
H:0,438, V:0,5
13.
H:0,188, V:0,5
14.
H:0,313, V:0,5
15.
H:0,438, V:0,563
16.
H:0,313, V:0,125
17.
H:0,125, V:0,25
18.
H:0,313, V:0,125
19.
H:0,25, V:0,25
20.
H:0, V:0,125
21.
H:0,188, V:0,125
22.
H:0,125, V:0,438
23.
H:0,313, V:0,125
24.
H:0,188, V:0,125
25.
H:0,188, V:0,5
26.
H:0,188, V:0,25
27.
H:0,313, V:0,188
28.
H:0,25, V:0,125
29.
H:0,188, V:0,438
30.
H:0,125, V:0,125
31.
H:0, V:0,313
32.
H:0,0625, V:0
33.
H:0,25, V:0,125
34.
H:0,188, V:0
35.
H:0,0625, V:0,125
36.
H:0,125, V:0,188
37.
38.
39.
40.
Recognized pattern
Best matching pattern

Examples of batch recognition on various damaged images



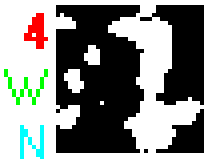


E
C
F
3
50,4%
47,8%
41,1%



Z
9
G
3
28,1%
25%
25%

1
E
I
16
50%
34,4%
31,3%

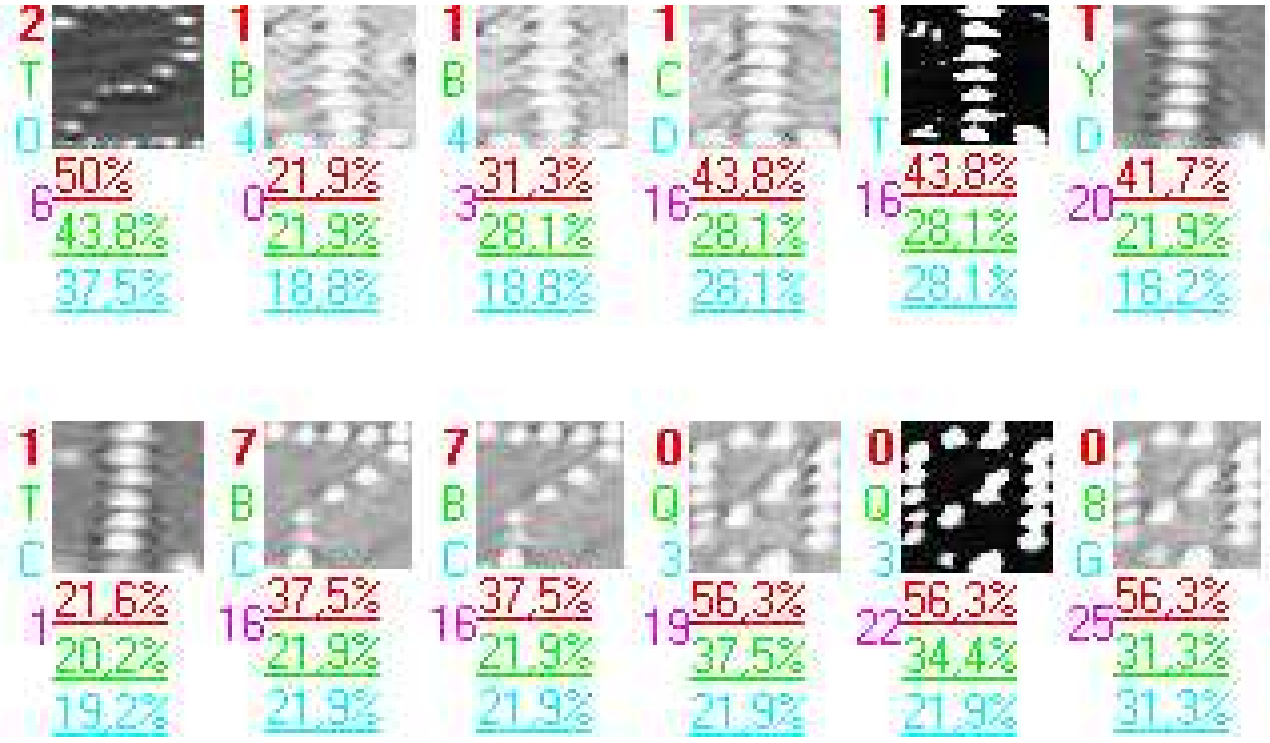


4
W
N
12
37,5%
25%
21,9%

6
5
B
28
78,1%
50%
43,8%

8
O
D
0
62,5%
62,5%
56,3%

7
2
3
16
53,1%
37,5%
34,4%


2
T
O
50%
6
43.8%
37.5%
1
B
4
21.9%
0
21.9%
18.8%
1
B
4
31.3%
3
28.1%
18.8%
1
C
D
43.8%
16
28.1%
28.1%
1
I
T
43.8%
16
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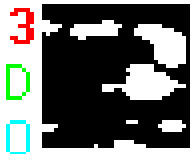
28.1%
T
Y
D
41.7%
20
21.9%
18.2%
1
T
C
21.6%
1
20.2%
19.2%
7
B
C
37.5%
16
21.9%
21.9%
7
B
C
37.5%
16
21.9%
21.9%
0
Q
3
56.3%
19
37.5%
21.9%
0
Q
3
56.3%
22
34.4%
21.9%
0
8
G
56.3%
25
31.3%
31.3%

9DO

6 46,9% 40,6% 34,4%

2DG

3 28,7% 25,7% 22,5%

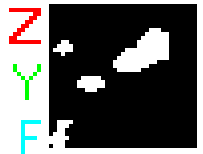


3DO

20 48,2% 28,6% 28,6%

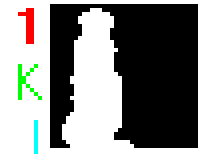
M20

3 22,5% 19,9% 19,9%



ZYF

4 22% 17,8% 14,3%



1KI

34 58,7% 25,1% 24,8%

5R3

6 40,6% 34,4% 31,3%